

the entire PCS broadband auction.

13. In short, the FCC not need give away \$750 million in order to avoid pulling the rug out from APC. Similarly, the FCC need not give away \$4.4 billion to avoid pulling the rug out from Cox and Omnipoint. To the extent that the FCC must offer any reward, it should be commensurate with the activity and the investment.

14. The PCS licenses have turned out to be more valuable than the CBO and others expected. Thus it was not the FCC's original intention to give away \$5.15 billion. The huge inflation is due to the surprisingly large valuation determined by the market in the first narrowband auction. This fact alone is an important argument to reconsider the free awards and to require pioneer preference award winners to pay for licenses.

15. Further evidence of the excessive nature of the award comes from the fact that none of the claimants even asked for an MTA. They certainly could not have relied upon the possible receipt of licenses of such enormous size and scope when they were developing their purported investments. To the extent that the successful preference winners asked for a BTA-sized service area, there can be no justification for giving any bidding credit or preferential treatment to an area greater than a BTA. No matter what the FCC does on the BTA-sized award, there should be absolutely no preferential treatment on the part of the license that covers the MTA excluding the relevant BTA. Even if it is not feasible to offer a bidding credit or guarantee on some BTA license, the FCC can

derive the economic equivalent of a BTA by prorating the value of the license by the fraction of the population that resides in the BTA relative to the MTA. Of the roughly 8 million people living in the Washington MTA, only 2.5 million or 31% reside in the Baltimore BTA and only 4 million or 50% live in the Washington MTA. Averaging these two, only 40% of the population live in a BTA-sized area. Thus, to the limited extent that APC deserves any preferential treatment, this treatment should only be applied to 40% of the license value. The other pioneer awards should be adjusted similarly to reflect the BTA population relative to the respective MTA populations.

16. Thus we now return to consider the pioneer's original request for a BTA license. How much credit should APC and other pioneer's get for the BTA proportion of their license? Giving away the entire value of a BTA, however, would still produce an excessive award. The Baltimore BTA for example, contains roughly 2.5 million pops so that its market value would be approximately \$234 million, a return that far exceeds anything necessary to compensate pioneers for the portion of their investments made in reliance on the pioneer's preference program.

17. Part of the reward for pioneering technology will come from the marketplace where a superior technology/product leads to superior returns. Of course, to get this return on technology, one needs a license. In the days of allocation by lottery, a superior product did not help win a lottery. But today, with an auction as the allocation mechanism, a superior product means that the firm with

this technology can outbid others for this license. The firm who can make this license most valuable should be able to win the license at auction and thereby recover the original investment. Preferential treatment needs to be given only to the extent that the pioneering activity is activity that benefits all parties and cannot be captured through the competitive advantage it provides in the use of a license.

18. To the extent that the government gives a license of broad scope, it often limits the value in some other way. For example, a patent only lasts for 17 years. The patent may also be rendered worthless if other firms are able to develop equivalent or superior alternatives. The PCS licenses are nominally awarded for a 10-year period. One possibility is to give APC the first ten-year tranche of the license for free. They would be required to pay the full value for the MTA pops outside the BTA and the residual value of the BTA pops for the renewal period and thereafter. Although it is not feasible to literally give APC a ten-year license, the FCC can do the economic equivalent. It can award APC the economic value of the first 10 years and require APC to pay the economic residual value from years 10 onward. Current models estimate that more than 7/8ths of the value of a PCS license come from the residual period following 2040.¹ Thus if the FCC were follow this approach, APC would be entitled to at most 1/8 of a BTA value, where a BTA is at most 40% of the value of an MTA license. All together, this

¹ The license is a real good and therefore the stream of income will appreciate with inflation. Hence, even if the real cash flow were constant, the residual value from 2040 onward is 74.4% of the total value using a 3% real discount rate.

suggests a 5% discount (1/8 of 40%) from an MTA market value. This is not a measly sum. A 5% discount from \$750 million is \$37.5 million, which is a 87.5% rate of return on their self-reported \$20 million investment.

19. However, a 5% bidding discount on a guaranteed license is worth more than its face value for several reasons. The additional value comes from the strategic and informational advantages that the guarantee provides.

20. If APC is guaranteed to win one of the Washington MTA licenses, APC has a huge advantage in the auction from its knowledge that it will automatically have one of the critical licenses in an East Coast network. The FCC decided on a simultaneous rather than sequential auction format. One of the primary reasons for picking this design is that it would not give any first-mover advantage to firms who won licenses early in the auction. As one who suggested a sequential format, I recognized that those who won early licenses would have significant strategic advantages in later bidding. However, since these early licenses would be available to all, bidders would have to pay for this advantage. APC and other pioneers, however, will get this advantage for free.

21. What is the source and size of this advantage? No bidder can be assured that he or she will win any specific license. There may always be someone else who is willing to pay more than any particular bidder. As a result, in thinking about how much one is willing to pay for a network, one always has to be cautious. That

is true for everyone except the pioneer winners. Simply knowing that they have a certain license gives them a tremendous advantage. Several firms have argued that having a regional network is worth at least a 10% premium. There are both technological returns to scale that allow better spectrum use as the borders as well as economic advantages to seamless roaming when the markets cover a larger geographic size.² In the B license, only the pioneers will be able to take advantage of this scale economy. When other firms bid for adjacent licenses, they know that Washington MTA will not be available in the B channel. Hence there will be significantly less competition for the PCS licenses in adjacent regions and this will be to APC's advantage. Being guaranteed a license has all the advantages of going first. Everyone else has to plan their strategy around you.

22. Requiring APC to pay for its license is also important for ex post competition. This is true for exactly the reverse reason that is typically stated. Unless APC is required to pay for its license, it may choose to enter the PCS market even though it will be an inefficient competitor. To put this in a somewhat extreme case, were I Barry Nalebuff to have been awarded this pioneer preference license, I would indeed take it for free. But, I would not be willing to pay 95% of the market value. The obvious reason is that I am not capable of running a competitive PCS operation. Given a

² Note that this first mover advantage exists only in the broadband PCS auction and does not exist in the narrowband nationwide license auction. The reason is that in the narrowband auction, all of the licenses were national licenses. Advance knowledge of winning a license does not give any advantage in building a national network since all licenses are national. There are no network externalities to be created.

free license, I could make some money but not enough to justify the true market value of the license. The problem is that my doing so would deny consumers the most efficient competitor coming into the Washington MTA market. The end market will be less competitive. Simply put, if APC or any other pioneer is unwilling to pay 95% of a license's market value, it has no business being in the PCS business.

23. Hence forth, I will assume that pioneers will be required to pay some fraction of the market value of the license. This still leaves three important questions unresolved. How do we determine the market value from which to give a credit? Should they be guaranteed a license or just given a bidding credit? How much credit should they be given?

24. The best market value of the license is the opportunity cost of giving the license to the pioneer rather than a bidder who wanted to purchase this license. A lower bound on this number is the highest losing bid on the A side. The FCC is directly giving up that much revenue from a willing buyer. Note that this is generous in that the losing bidder will have been unable to form a regional network and thus the losing bid will not include the valuable network externalities that accrue to the winning bidder.

25. *The importance of how the license is awarded is perhaps under appreciated.* Take as the status quo is that APC will be guaranteed a license at a price equal to say 95% of the market value. As such, there will be no bidding on the B side for the Washington MTA. I

believe this will be mistake.

26. In effect, the pioneers are being given an option. If the market value exceeds their expectations and their own forecasted value, even with the purchase credit, the pioneers will walk away from the option. This will create havoc. The FCC will then have to resell the license in a separate auction where it could go for much less than it would have fetched in the original auction. Networks will already have been formed so that there will only be one or two buyers who can really use the MTA as part of their regional or national plan. Effectively, a pioneer would be turning down the license exactly at the time when it would be difficult to sell. The pioneer might then even buy it in the make-up auction at an even further reduced price.

27. The ability to see what happens in the entire auction and then compare PCS to post-auction cellular market values before deciding whether to purchase the license is a very valuable option. This alone could be worth more than a 5% bidding credit. The ability to get a guaranteed opportunity to purchase a particular license following the auction is even more valuable than a bidding credit because of the option value of allowing the pioneer to base its decision whether or not to acquire the license on post-auction information.

28. If there is any doubt as to the value of going first and getting this option, I propose a test. Ask the pioneers if they would be willing to put this guarantee up for sale prior to the PCS

auction with a minimum reserve bid of \$50 million. I suggest that they would not be willing to sell this right for \$50 million, even though they could use this \$50 million to buy the other PCS license or distribute to their shareholders. APC should not be allowed to claim that such an award is not valuable without giving the market a chance to disprove that assertion.

29. *The preferred solution is to give APC and other pioneers a bidding credit without a guarantee of a license.*³ If, as APC says, they are committed to purchasing the Washington MTA license no matter what it costs, then this will lead to the same outcome as giving them an option. In the status quo, they are apparently claiming that they will purchase a license without knowing what it will cost. With that same strategy, APC can also go to the auction and be guaranteed a license. Only to the extent that the auction price (including the credit) exceeds what they are willing to pay will they not be guaranteed a license, but in that same case, they would have also defaulted on the required payment for their "guaranteed" license.

30. It should be recognized that a bidding credit may give

³To minimize the inefficiency caused by a bidding credit, the Commission may want to consider not restricting the bidding credit to any one particular MTA. A further option the Commission might want to explore is to give each pioneer a bidding credit in the form of a certain number of free pops instead of a certain fixed percentage discount. The pioneer could apply its "free pops" to pay for the pro rata share of any purchased license. Different pioneers could get different number of free pops based on their respective contributions. For example, a 400,000 pops bidding credit would count for a 100% bidding credit toward a license with 400,000 pops, or a 10% bidding credit for a license covering 4 million pops, or a 5% credit for a license covering 8 million pops.

strategic advantages in the auction that amplify its face value. A bidding credit give a first-mover advantage in forming a regional network and thus capturing the extra value therein (and denying it to others). Furthermore, the ultimate price paid may be a discount off of a depressed price since others will be less willing to bid against pioneers cognizant of an amplified winner's curse effect.⁴

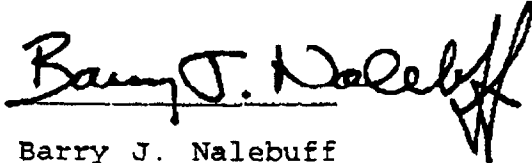
31. In conclusion, given the enormous value of the MTA licenses, even a small bidding credit is worth a large amount of money. The three MTA licenses awarded as part of pioneer preferences may be worth as much as \$5.15 billion. To recognize their potential contribution without causing undue enrichment, the pioneers are entitled to some small bidding credit. This type of favorable treatment in the auction is in itself valuable and thus multiplies the effect of any bidding credit. If instead the award is done through a license guarantee, no extra bidding credit may be required; a guarantee provides both a first-mover advantage in bidding for adjacent licenses and an option value, the combined effects of which may be extremely valuable for the larger MTA licenses. It is my belief that a guarantee of a license by itself or 5% bidding credit, magnified by the strategic advantages, is

⁴ This is a somewhat technical argument. There is a significant common value component in the license value. If the valuations were completely common, then no one has any ability to bid against someone with a 5% credit. For example, if I outbid such a person, I must surely have overpaid for the license. I know that the license is worth the same amount to the two of us. How can I possibly outbid you if you only have to pay 95% and I have to pay 100% of my bid? The effect of the winner's curse in the presence of a bidding credit to one bidder is to depress everyone else's bidding. Not only will the pioneer get the license at some discount, say 5%, but that will be a discount off of a depressed price. No one will want to outbid the pioneers and this will keep prices artificially low.

more than sufficient compensation to give the pioneers a return on any investment made in reliance of the pioneer preference program.

I declare, under penalty of perjury, that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed on August 1, 1994.

A handwritten signature in cursive script, reading "Barry J. Nalebuff". The signature is written in dark ink and is positioned above the printed name.

Barry J. Nalebuff

Certificate of Service

I, Michael K. Kellogg, certify that on this 1st day of August, 1994, I caused copies of the foregoing Joint Response of Pacific Bell and Bell Atlantic Personal Communications to American Personal Communication's Post-Remand Filings to be served by first class mail, postage prepaid, or by hand, on the parties on the attached service list.

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Satellite CD Radio, Inc

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Southern New England
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Southwestern Bell	Linda D. Hershman 227 Church Street New Haven, CT 06510
The Special Industrial Radio Service Association, Inc.	Paula J. Fulks 175 E. Houston, Rm. 1218 San Antonio, TX 78205
Spectralink Corporation	Wayne V. Black Keller and Heckman 1150 17th Street, NW Suite 1000 Washington, DC 20036
Sprint	Thomas Ohlson 1650 38th Street Boulder, CO 80301
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Strother Communications, Inc.	Pete Wanzenried 601 Sequoia Pacific Blvd. Sacramento, CA 95814-0282
Suite 12 Group	Daniel F. VanHorn Arent, Fox, Kinter, Plotkin & Kahn 1050 Connecticut Ave, NW Washington, DC 20036-5339
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TECO Energy Inc.	S. M. Samuels 103 West Mark Street Swayzee, IN 46986
TRW Inc.	Gregg Ehlers P.O. Box 111 Tampa, FL 33601-0111
Taconic Telephone Corp.	Stephen D. Baruch ¹ Leventhal, Senter & Lerman 2000 K Street, NW Suite 600 Washington, DC 20006
Taft Broadcasting Company	Lorinda Ackely Old Route 22 Copake, NY 12516
Tandy Corporation	Paul Taft 4808 San Felipe Road Houston, Texas 77056
Teknekron Communications Systems	John W. Pettit Hopkins & Sutter 888 16th Street, N.W. Suite 700 Washington, D.C. 20006
Tele-Communications, Inc.	Roger A. Strauch 2121 Allston Way Berkeley, CA 94704-1301
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Teleport Denver	Michael L. Glaser Hopper & Kanouff 1610 Wynkoop, Suite 200 Denver, CO 80202-1196
Telesciences	Howard Oringer 600 Montgomery Street San Francisco, CA 94111
Tel/Logic, Inc.	Tel/Logic, Inc. 51 Shore Drive Plandome, NY 11030
Telmarc Telecommunications	Terrence P. McGarty 265 Franklyn Street Boston, MA 02110
Telocator	Thomas A. Stroup 1019 19th Street, NW Suite 1100 Washington, D.C. 20036
Texas Advisory Commission on State Emergency Communications	W. Scott McCollough Asst. Texas Attorney General P.O. Box 12548 300 W. 15th Street, 7th Floor Austin, TX 78701
Texas Wired Music, Inc.	Wm. D. Balthrope P.O. Box 8278 San Antonio, Texas 78208
Time Warner	Aaron I. Fleischman Fleischman and Walsh 1400 16th Street, NW, Suite 600 Washington, D.C. 20036
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United Native American Telecommunications, Inc.	James L. Bradley 1604 Sanday Lane Burlington, Washington 98233
Union Pacific Railroad Co. Missouri Pacific Railroad Co.	Gene H. Kuhn 1416 Dodge Street Omaha, Nebraska 68179
United Parcel Service, Inc.	Fred F. Fielding Wiley, Rein & Fielding 1776 K Street, NW Washington, DC 20006
United Power	Mohamed Lyzzaik P.O. Box 929 Brighton, CO 80601
USA Mobile Communications, Inc.	Laura H. Phillips Dow, Lohnes & Albertson

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US West Newvector Group, Inc	Joseph C. O'Neil 3350 161st Avenue, SE Bellevue, WA 98008-1329
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U.S. Department of Justice	Luin P. Fitch, Jr. Room 8104 555 Fourth Street, N.W. Washington, D.C. 20001
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Waterway Communications System Inc.	Martin W. Bercovici Keller & Heckman 1001 G Street, NW Suite 500 West Washington, DC 20001
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